CLAIMS

What is claimed is:

1. A method of coating a substrate surface, comprising:
providing a target material;
providing a substrate;
ablating said target material to form ablated target particulate material;
directing the ablated target particulate material with a gas flow;
and coating said substrate surface with said ablated target particulate material to form a coated substrate.
2. The method of claim 1, wherein the coating occurs at a pressure of about 1 Torr or higher.
3. The method of claim 2, wherein the coating occurs at a pressure of about 760 Torr.
4. The method of claim 1, wherein the gas flow is directed at the substrate at a flow rate of about 1 milliliter per minute or higher, and at a velocity sufficient to direct the ablated particulate material toward the substrate.
5. The method of claim 2, wherein the gas flow is directed at the substrate at a flow rate of about 10 milliliters per minute or higher.
6. The method of coating a substrate according to claim 1, wherein the target material comprises at least one of biodegradable polymers, biocompatible polymers, chemoselective polymers, polysaccharides, and proteins.
7. The method of coating a substrate according to claim 1, wherein said ablating is achieved by the use of a high-energy source.
8. The method of coating a substrate according to claim 7, wherein the high-energy source is a laser selected from ion laser, diode array laser, and pulsed excimer laser.

9. The method of claim 1, wherein coating said substrate material with said ablated particulate target material results in a coating on the substrate having a thickness of less than about 1 mm.
10. The method of claim 9, wherein said coating on the substrate has a thickness of less than about 0.1 mm.
11. The method of claim 10, wherein said coating on the substrate has a thickness of less than about 0.01 mm.
12. The method of claim 1, wherein said substrate comprises at least one surface of a biomedical device selected from the group consisting of electronic gas sensors, acoustic gas sensors, microfluidic biosensors, microarrays, at least partially implanted devices, or external devices in contact with biological fluids and/or surfaces.
13. The method of claim 12, wherein said substrate is a biomedical device selected from stents, catheters, vascular grafts, contact lenses, ocular implants, oral implants, hip implants, pacemakers, defibrillators, and bone fixation devices.
14. The method of claim 12, wherein said substrate is a sensor device selected from metal-oxide sensors, conducting polymer sensors, electrochemical sensors, fiber-optic fluorescent sensors, and surface acoustic wave sensors.
15. The method of claim 1, wherein said coating of the target material on the substrate results in a continuous coating.
16. The method of claim 1, wherein said coating of the target material on the substrate results in a discontinuous coating.
17. The method of claim 1, wherein the gas flow is directed away from the substrate at a flow rate of about 1 milliliter per minute or higher, and at a velocity sufficient to decrease the rate of deposition of the ablated particulate material on the substrate.
18. A coated substrate formed according to the method of claim 1.
19. A method of coating a substrate surface, comprising:
providing a target material;

providing a substrate;
ablating said target material to form ablated target particulate material;
directing the ablated target particulate material toward the substrate with a gas flow;
and coating said substrate surface with said ablated target particulate material to form a coated substrate;
wherein the coating occurs at a pressure of about 1 Torr or higher;
and wherein the coating results in a coating thickness on the substrate less than about 1 mm.

20. A coating apparatus comprising:

a coating chamber housing a target material in its interior;
the chamber comprising a transparent window;
a target evaporation source exterior to the coating chamber;
a means for directing a gas flow toward the substrate.